



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,347	09/25/2003	Takahiko Nakano	0951-0125P	6595
2292	7590	04/14/2006	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			NGUYEN, SANG H	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 04/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/669,347

Applicant(s)

NAKANO, TAKAHIKO

Examiner

Sang Nguyen

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE 03/23/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission RCE filed on 03/23/06 has been entered.

Claim Objections

Claim 5 recites the limitation "said at least one filter" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "said at least one filter" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dong (U.S. Patent No. 5,923,427) in view of Gweon et al (U.S. Patent No. 6,563,098).

Regarding claim 1; Dong discloses a triangulation-type optical displacement

sensor (figure 1) having at least one light-emitting element (10 of figure 1) for projecting light onto at least one target (T of figure 1) to which one or more distances being measured (X1, X2 of figure 1) , and at least one light-receiving element (12 of figure 1) for receiving at least a portion of the light reflected (figure 1) from at least one of the distance measurement targets (T of figure 1 from distances X1, X2 of figure 1) and being disposed such that at least one light-receiving surface (12 of figure 1) thereof is substantially perpendicular to at least one optical axis (figure 1 and col.1 lines19-21) of at least a portion of the projected light (col.1 lines 15-60). See figure 1.

U.S. Patent

Jul. 13, 1999

Sheet 1 of 4

5,923,427

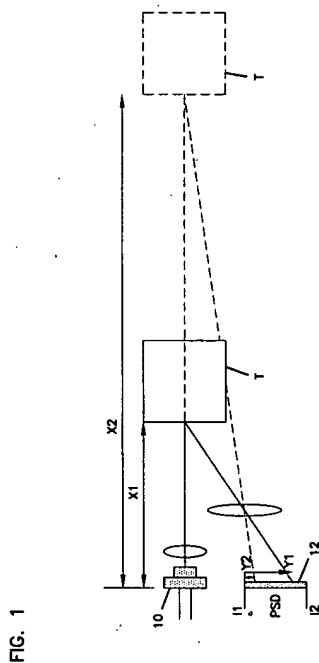


FIG. 1

U.S. Patent

May 13, 2003

Sheet 1 of 5

US 6,563,098 B2

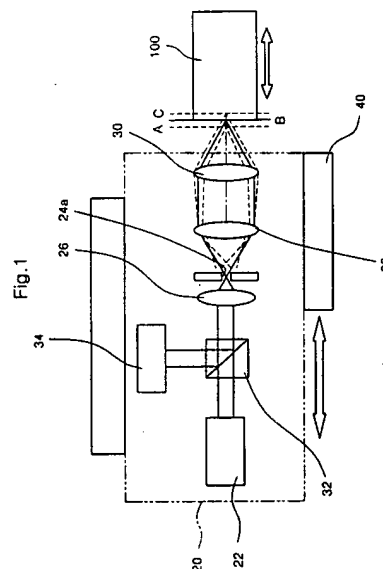


Fig. 1

Dong discloses all of features of claimed invention except for at least one slit for narrowing at least one light beam projected toward at least one of the distance

Art Unit: 2877

measurement targets, and said at least one slit for narrowing at least a portion of the light reflected from aid at least one of the distance measurement targets. However, Gweon et al teaches that it is known in the art to provide high-precision unit displacement sensor (10 of figure 1) comprising a laser source (22 of figure 1), and a photodetector (34 of figure 1), wherein the light source (22 of figure 1) for projecting light beam through a slit or pin hole (24a of figure 1 and col.4 lines 4-6) to narrow at least one light beam projected toward at least one of the distance measurement targets (A, B, C of figure 1) of the object (100 of figure 1), and said at least one slit (24a of figure 1) for narrowing at least a portion of the light reflected (figure 1) from aid at least one of the distance measurement targets (A, B, C of figure 1) of the object (100 of figure 1 and col.4 lines 3-36). See figure 1.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a triangulation-type optical displacement sensor of Dong with at least one slit for narrowing at least one light beam projected toward at least one of the distance measurement targets, and said at least one slit for narrowing at least a portion of the light reflected from aid at least one of the distance measurement targets as taught by Gweon et al for the purpose of reducing or narrowing bandwidth wavelength for measuring high accurate the displacement of a target surface in wide range.

Claim 4 rejected under 35 U.S.C. 103(a) as being unpatentable over Dong in view of Gweon et al as applied to claim 1 above, and further in view of Reichard (U.S. Patent No. 3,740,563).

Regarding claim 4; Dong in view of Gweon et al discloses all of features of the claimed invention except for the at least one filter being arranged at an exit side of at least one of slit for narrowing the at least one of the light beams projected toward at least one of the distance measurement targets, and at least one filter being arranged at the incident side of at least the one of the slits narrowing at least a portion of the light reflected from at least one of the distance measurement targets. However, Reichard teaches that it is known in the art to provide at least one filter (31 of figure 1A) being arranged at an exit side of at least one of slit (34 of figure 1A) for narrowing the at least one of the light beams projected toward at least one of the distance measurement targets (96, 99 of figure 1), and at least one another filter (31 of figure 1A) being arranged at the incident side of at least the one of the slits narrowing at least a portion of the light reflected from at least one of the distance measurement targets to a photodetector (21 of figure 1A). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a triangulation-type optical displacement sensor of Dong with the at least one filter being arranged at an exit side of at least one of slit for narrowing the at least one of the light beams projected toward at least one of the distance measurement targets, and at least one filter being arranged at the incident side of at least the one of the slits narrowing at least a portion of the light reflected from at least one of the distance measurement targets as taught by Reichard for the purpose of filtering or reducing noise light system.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dong (U.S. Patent No. 5,923,427) in view of Laib (U.S. Patent No. 4,373,816).

Regarding claim 2; Dong discloses a triangulation-type optical displacement sensor (figure 1) having at least one light-emitting element (10 of figure 1) for projecting light onto at least one target (T of figure 1) to which one or more distances being measured (X1, X2 of figure 1) , and at least one light-receiving element (12 of figure 1) for receiving at least a portion of the light reflected (figure 1) from at least one of the distance measurement targets (T of figure 1 from distances X1, X2 of figure 1) and being disposed such that at least one light-receiving surface (12 of figure 1) thereof is substantially perpendicular to at least one optical axis (figure 1 and col.1 lines19-21) of at least a portion of the projected light (col.1 lines 15-60). See figure 1.

Dong discloses all of features of claimed invention except for at least one slit for narrowing at least one light beam projected toward at least one of the distance measurement targets. However, Laib teaches that it is known in the art to provide a triangulation-type optical sensor device (10 of figure 1) having a light source (102 of figure 6), a receiver photoelectric sensing device (122, 128 of figure 6), and at least one straight and narrow slit (108 of figures 6-8 and col.10 lines 25-50 and col.11 lines 7-13) for narrowing at least one light beam projected toward at least one of the distance measurement targets (A, B, C of figure 1) of the Target (14 of figure 1). See figures 1-12.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a triangulation-type optical displacement

sensor of Dong with at least one slit for narrowing at least one light beam projected toward at least one of the distance measurement targets as taught by Laib for the purpose of reducing in the size of the aperture and reducing the total amount of light transmitted.

Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dong in view of Laib as applied to claim 2 above, and further in view of Ikari et al (U.S. Patent No. 4,864,147).

Regarding claim 3; Dong in view of Laib discloses all of features of claimed invention except for the at least one of light collecting element is a cylindrical lens. However, Ikari et al teaches that it is known in the art to provide the receiving lens system (13 of figures 1 and 10-11) considered to be the at least one of light collecting element is a cylindrical lens (col.10 lines 25-31 and claim 4). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a triangulation-type optical displacement sensor of Dong with the at least one of light collecting element is a cylindrical lens as taught by Ikari et al for the purpose of focusing light beam to image sensor with high accuracy image.

Claim 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dong in view of Laib, further in view of Ikari et al as applied to claims 2-3 above, and further in view of Reichard (U.S. Patent No. 3,740,563).

Regarding claims 5-6; Dong in view of Laib, further in view of Ikari et al discloses all of features of the claimed invention except for the at least one filter being arranged at an exit side of at least one of slit for narrowing the at least one of the light

beams projected toward at least one of the distance measurement targets. However, Reichard teaches that it is known in the art to provide at least one filter (31 of figure 1A) being arranged at an exit side of at least one of slit (34 of figure 1A) for narrowing the at least one of the light beams projected toward at least one of the distance measurement targets (96, 99 of figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine a triangulation-type optical displacement sensor of Dong with the at least one filter being arranged at an exit side of at least one of slit for narrowing the at least one of the light beams projected toward at least one of the distance measurement targets as taught by Reichard for the purpose of filtering or reducing noise light system.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Okada et al (6839144) discloses optical displacement sensor; Schulz et al (6141104) discloses system for determination of a location in three dimensional space; Yaginuma (5652432) discloses cylindrical body inspection apparatus; Mizutani et al (4748333) discloses surface displacement sensor with opening angle control; Rosenfeld (4647193) discloses optical target ranging apparatus; or Morander (4548504) discloses device for determining the real or the virtual distance of a source of light from measuring plane.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Nguyen whose telephone number is (571) 272-2425. The examiner can normally be reached on 9:30 am to 7:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 7, 2006

SN


Sang Nguyen
Patent Examiner
Art Unit 2877